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FACSIMILE TRANSMITTAL SHEET

TO:	FROM:
Liana Chase	Joe Andras
COMPANY:	DATE:
USPTO	8/31/2005
FAX NUMBER:	TOTAL NO. OF PAGES INCLUDING COVER:
(571) 273-8300	1 OF 4
PHONE NUMBER:	SENDER'S REFERENCE NUMBER:
	CAS1.PAU.24.R2.V2
RE:	YOUR REFERENCE NUMBER:
Petition	

NOTES/COMMENTS:

Per your request, attached is the Petition to Accept Reissue Application Decs.

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19900 MacArthur Blvd., 11th Floor *** Irvine, CA *** 92612

Phone: (949) 223-9600 *** Fax: (949) 223-9610

Docket No. CAS1.PAU.24.R2

Reissue Application

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Reissue of:

Sanchez et al.

Patent No.: 5,635,235

Date of Patent: June 3, 1997

Serial No.: 09/753,171

For: METHODS FOR HANDLING MASA

Examiner: (Unassigned)

Group Art Unit: 1761

Costa Mesa, California

October 26, 2004

PETITION TO ACCEPT REISSUE APPLICATION DECLARATIONS OF NON-SIGNING INVENTORS VICTOR SANCHEZ AND ALBERTO CEJA PURSUANT TO 37 C.F.R. §1.47(a)

Assistant Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In connection with the accompanying Request for Continued Examination, and in view of the Decision on Appeal pertaining to the above-identified application for the reissue of U.S. Patent No. 5,635,235 (the "235 Patent"), Casa Herrera, Inc. ("Applicant"), assignee of the '235 Patent, hereby petitions for acceptance of the REISSUE APPLICATION DECLARATION BY THE INVENTORS of non-signing inventors Victor Sanchez and Alberto Ceja. The REISSUE APPLICATION DECLARATION BY THE INVENTOR executed by Rigoberto Anguiano is separately submitted.

The invention is directed to methods for handling masa. Victor R. Sanchez, Alberto Ceja, and Rigoberto Anguiano were the Inventors of the '235 Patent. The

individual inventors originally assigned the '235 Patent to Machine Masters, Inc., which later declared bankruptcy. Applicant purchased the '235 Patent from Howard Ehrenberg, the Trustee in Bankruptcy for Machine Masters, Inc. Proof of these assignments can be found in the records of the U.S. Patent and Trademark Office. These assignments were recorded on June 16, 1994 and May 17, 1999 at reel 7069, frame 0592 and reel 9950, frame 0534, respectively.

The omitted inventors and their last known addresses:

Victor Sanchez
14214 Edgehill Court
Fontana, CA 92337-1019

Alberto Ceja
9528 E. Nan Street
Pico Rivera, CA 900660


On September 30, 2004, a letter was sent by certified U.S. mail, with return receipt requested, to the above-identified inventors requesting the inventors review the specification, drawings, and claims and to execute the REISSUE APPLICATION DECLARATION BY THE INVENTORS. Attached are true and correct copies of:

- 1) the letter sent to Mr. Victor Sanchez, identified as Exhibit 1;
- 2) an unexecuted REISSUE APPLICATION DECLARATION BY THE INVENTOR enclosed in the letter to Mr. Victor Sanchez, identified as Exhibit 2;
- 3) the letter sent to Mr. Alberto Ceja, identified as Exhibit 3;
- 4) an unexecuted REISSUE APPLICATION DECLARATION BY THE INVENTOR enclosed in the letter to Mr. Alberto Ceja, identified as Exhibit 4;


- 5) the specification, amendments and drawings enclosed with the letters to Mr. Sanchez and Mr. Alberto Ceja as Exhibits A to D, collectively identified as Exhibit 5.

Mr. Victor Sanchez and Mr. Alberto Ceja have not responded by mailing back an executed REISSUE APPLICATION DECLARATION BY THE INVENTOR.

It is necessary for Casa Herrera, Inc., the present assignee of the '235 Patent, to make a reissue application on behalf of Mr. Victor Sanchez and Mr. Alberto Ceja because they have refused to execute the declaration regarding certain elements in the claims which were too narrowly drafted. Specifically, claims directed to a hopper are too narrow. Applicant seeks to remedy this error as allowed by the scope of the original specification without adding new matter.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, P.O. Box 1450, Alexandria, VA 223131-1450 on	
October 27, 2004	
by Eric Hoover	
	
Signature	
October 27, 2004	

Respectfully submitted,



Joseph C. Andras
Registration No. 33,469
Myers, Dawes & Andras LLP
19900 MacArthur Blvd., Suite 1150
Irvine, CA 92612
Tel: (949) 223-9600
Fax: (949) 223-9610

PTO/SB/51 (09-04)
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REISSUE APPLICATION DECLARATION BY THE INVENTOR	Docket Number (Optional) CAS1.PAU.24.R2
--	---

I hereby declare that:
Each inventor's residence, mailing address and citizenship are stated below next to their name.
I believe the inventors named below to be the original and first inventor(s) of the subject matter which is described and claimed in patent number 5,635,235 granted 08/03/1997 and for which a reissue patent is sought on the invention entitled Methods For Handling Masa

the specification of which

☐ is attached hereto.

☒ was filed on 12/29/2000 as reissue application number 09/753,171

and was amended on
December 29, 2000 ("Preliminary Amendment Submitted With Continuation Reissue Application"); May 4, 2001 ("Substitute Preliminary Amendment" and the accompanying Substitute Reissue Specification); and April 1, 2002 ("First Amendment")

I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

☐ I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b). Attached is form PTO/SB/02B (or equivalent) listing the foreign applications.

I verily believe the original patent to be wholly or partly inoperative or invalid, for the reasons described below. (Check all boxes that apply.)

☐ by reason of a defective specification or drawing.

☒ by reason of the patentee claiming more or less than he had the right to claim in the patent.

☐ by reason of other errors.

At least one error upon which reissue is based is described below. If the reissue is a broadening reissue, such must be stated with an explanation as to the nature of the broadening:

The claims directed to a "hopper" are too narrow.

[Page 1 of 2]

This collection of information is required by 37 CFR 1.178. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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(REISSUE APPLICATION DECLARATION BY THE INVENTOR, page 2)		Docket Number (Optional) CAS1.PAU.24.R2	
All errors corrected in this reissue application arose without any deceptive intention on the part of the applicant.			
Note: To appoint a power of attorney, use form PTO/SB/81.			
Correspondence Address: Direct all communications about the application to:			
<input type="checkbox"/> The address associated with Customer Number: 			
OR			
<input checked="" type="checkbox"/> Firm or Individual Name	Myers Dawes Andras & Sherman LLP		
Address	19900 MacArthur Blvd., 11th Floor		
City	Irvine	State	CA Zip 92612
Country	USA		
Telephone	(949) 223-9600	Fax	(949) 223-9610
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine and imprisonment, or both, under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this declaration is directed.			
Full name of sole or first inventor (given name, family name) Victor R. Sanchez			
Inventor's signature		Date	
Residence 14214 Edgehill Court, Fontana, CA 92337-0109		Citizenship Mexico	
Mailing Address Same As Above			
Full name of second joint inventor (given name, family name) Alberto Ceja			
Inventor's signature		Date	
Residence 9528 E. Nan Street, Pico Rivera, CA 90660		Citizenship USA	
Mailing Address Same As Above			
Full name of third joint inventor (given name, family name) Rigoberto Anguiano			
Inventor's signature <i>X Rigoberto Anguiano</i>		Date <i>X 10/13/04</i>	
Residence 14619 California Ave., Baldwin Park, CA 91706		Citizenship Mexico	
Mailing Address Same As Above			
<input type="checkbox"/> Additional joint inventors or legal representative(s) are named on separately numbered sheets forms PTO/SB/02A or 02LR attached hereto.			

(Page 2 of 2)

EXHIBIT 1

MYERS DAWES ANDRAS & SHERMAN LLP
An Intellectual Property Law Firm

September 30, 2004

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Victor R. Sanchez
14214 Edgehill Court
Fontana, CA 92337-0109

Re: Reissue Patent Application
For: METHODS FOR HANDLING MASA (Patent No. 5,635,235)
Our Ref. No.: CAS1.PAU.24.R2

Dear Mr. Sanchez:

Enclosed for your review are a copy of a reissue application directed to the above-identified patent including: (A) the original application; (B) a "Preliminary Amendment Submitted With Continuation Reissue Application" that was filed on December 29, 2000; (C) a "Substitute Preliminary Amendment" and Substitute Reissue Specification that were filed on May 4, 2001; and (D) a "First Amendment" that was filed on April 1, 2002. These materials were filed in the U.S. Patent and Trademark Office on behalf of Casa Herrera, Inc. to fix certain defects in the above-identified patent.

Also enclosed for your review and signature is a new **REISSUE APPLICATION DECLARATION BY THE INVENTOR** (the "Declaration"). Please sign the Declaration where indicated and return it to us in the enclosed pre-addressed envelope by **October 15, 2004**. If we do not hear from you by that date, we will interpret that as a refusal to sign the declaration and will file an appropriate petition in the U.S. Patent and Trademark Office to proceed without your signature.

Thank you for your assistance.

Please call if you have any questions or comments.

Sincerely,

Joseph C. Andras

JCA/erh
Enclosures

19900 MacArthur Blvd., 11th.
Phone: (949) 223-9600

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VICTOR R. SANCHEZ
Street, Apt. No.
or PO Box No. 14214 EDGEHILL CT.
City, State, ZIP+4
Fontana, CA 92337-0109
PS Form 3800, June 2002 See Reverse for Instructions

EXHIBIT 2

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.
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REISSUE APPLICATION DECLARATION BY THE INVENTOR	Docket Number (Optional) CAS1.PAU.24.R2
<p>I hereby declare that: Each inventor's residence, mailing address and citizenship are stated below next to their name. I believe the inventors named below to be the original and first inventor(s) of the subject matter which is described and claimed in patent number <u>5,635,235</u> granted <u>06/03/1997</u> and for which a reissue patent is sought on the invention entitled <u>Methods For Handling Masa</u></p> <p>the specification of which</p> <p><input type="checkbox"/> is attached hereto.</p> <p><input checked="" type="checkbox"/> was filed on <u>12/29/2000</u> as reissue application number <u>09/753,171</u></p> <p>and was amended on <u>December 29, 2000 ("Preliminary Amendment Submitted With Continuation Reissue Application"); May 4, 2001 ("Substitute Preliminary Amendment" and the accompanying Substitute Reissue Specification); and April 1, 2002 ("First Amendment")</u></p> <p>I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.</p> <p>I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.</p> <p><input type="checkbox"/> I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b). Attached is form PTO/SB/02B (or equivalent) listing the foreign applications.</p> <p>I verily believe the original patent to be wholly or partly inoperative or invalid, for the reasons described below. (Check all boxes that apply.)</p> <p><input type="checkbox"/> by reason of a defective specification or drawing.</p> <p><input checked="" type="checkbox"/> by reason of the patentee claiming more or less than he had the right to claim in the patent.</p> <p><input type="checkbox"/> by reason of other errors.</p> <p>At least one error upon which reissue is based is described below. If the reissue is a broadening reissue, such must be stated with an explanation as to the nature of the broadening:</p> <p style="margin-top: 20px;">The claims directed to a "hopper" are too narrow.</p>	

[Page 1 of 2]

This collection of information is required by 37 CFR 1.175. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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(REISSUE APPLICATION DECLARATION BY THE INVENTOR, page 2)		Docket Number (Optional) CAS1,PAU.24.R2	
All errors corrected in this reissue application arose without any deceptive intention on the part of the applicant.			
Note: To appoint a power of attorney, use form PTO/SB/81.			
Correspondence Address: Direct all communications about the application to:			
<input type="checkbox"/> The address associated with Customer Number: 			
OR			
<input checked="" type="checkbox"/> Firm or Individual Name	Myers Dawes Andras & Sherman LLP		
Address	19900 MacArthur Blvd., 11th Floor		
City	Irvine	State	CA
Country	USA		
Telephone	(949) 223-9600	Fax	(949) 223-9610
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine and imprisonment, or both, under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this declaration is directed.			
Full name of sole or first inventor (given name, family name) Victor R. Sanchez			
Inventor's signature		Date	
Residence 14214 Edgehill Court, Fontana, CA 92337-0109		Citizenship Mexico	
Mailing Address Same As Above			
Full name of second joint inventor (given name, family name) Alberto Ceja			
Inventor's signature		Date	
Residence 9528 E. Nan Street, Pico Rivera, CA 90660		Citizenship USA	
Mailing Address Same As Above			
Full name of third joint inventor (given name, family name) Rigoberto Anguiano			
Inventor's signature		Date	
Residence 14619 California Ave., Baldwin Park, CA 91706		Citizenship Mexico	
Mailing Address Same As Above			
<input type="checkbox"/> Additional joint inventors or legal representative(s) are named on separately numbered sheets forms PTO/SB/02A or 02LR attached hereto.			

[Page 2 of 2]

EXHIBIT 3

MYERS DAWES ANDRAS & SHERMAN LLP.
An Intellectual Property Law Firm

September 30, 2004

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Alberto Ceja
9528 E. Nan Street
Pico Rivera, CA 90660

Re: Reissue Patent Application
For: METHODS FOR HANDLING MASA (Patent No. 5,635,235)
Our Ref. No.: CAS1.PAU.24.R2

Dear Mr. Ceja:

Enclosed for your review are a copy of a reissue application directed to the above-identified patent including: (A) the original application; (B) a "Preliminary Amendment Submitted With Continuation Reissue Application" that was filed on December 29, 2000; (C) a "Substitute Preliminary Amendment" and Substitute Reissue Specification that were filed on May 4, 2001; and (D) a "First Amendment" that was filed on April 1, 2002. These materials were filed in the U.S. Patent and Trademark Office on behalf of Casa Herrera, Inc. to fix certain defects in the above-identified patent.

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Thank you for your assistance.

Please call if you have any questions or comments.

Sincerely,

[Signature]
Joseph C. Andras

JCA/erh
Enclosures

19900 MacArthur Blvd., 11th Fl.

Phone: (949) 223-9600

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Street Apt. No. or PO Box No. 9528 E. Nan St.	
City, State, ZIP+4 PICO RIVERA CA 90660	
PS Form 3800, June 2002	

EXHIBIT 4

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REISSUE APPLICATION DECLARATION BY THE INVENTOR	Docket Number (Optional) CAS1,PAU,24,R2
<p>I hereby declare that: Each inventor's residence, mailing address and citizenship are stated below next to their name. I believe the inventors named below to be the original and first inventor(s) of the subject matter which is described and claimed in patent number <u>5,635,235</u>, granted <u>06/03/1997</u> and for which a reissue patent is sought on the invention entitled <u>Methods For Handling Masa</u></p> <p>the specification of which</p> <p><input type="checkbox"/> is attached hereto.</p> <p><input checked="" type="checkbox"/> was filed on <u>12/29/2000</u> as reissue application number <u>09/753,171</u></p> <p>and was amended on December 29, 2000 ("Preliminary Amendment Submitted With Continuation Reissue Application"); May 4, 2001 ("Substitute Preliminary Amendment" and the accompanying Substitute Reissue Specification); and April 1, 2002 ("First Amendment")</p> <p>I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.</p> <p>I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.</p> <p><input type="checkbox"/> I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b). Attached is form PTO/SB/02B (or equivalent) listing the foreign applications.</p> <p>I verily believe the original patent to be wholly or partly inoperative or invalid, for the reasons described below. (Check all boxes that apply.)</p> <p><input type="checkbox"/> by reason of a defective specification or drawing.</p> <p><input checked="" type="checkbox"/> by reason of the patentee claiming more or less than he had the right to claim in the patent.</p> <p><input type="checkbox"/> by reason of other errors.</p> <p>At least one error upon which reissue is based is described below. If the reissue is a broadening reissue, such must be stated with an explanation as to the nature of the broadening:</p> <p>The claims directed to a "hopper" are too narrow.</p>	

[Page 1 of 2]

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(REISSUE APPLICATION DECLARATION BY THE INVENTOR, page 2)		Docket Number (Optional) CAS1:PAU.24.R2	
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Note: To appoint a power of attorney, use form PTO/SB/81.			
Correspondence Address: Direct all communications about the application to:			
<input type="checkbox"/> The address associated with Customer Number: 			
OR			
<input checked="" type="checkbox"/> Firm or Individual Name	Myers Dawes Andras & Sherman LLP		
Address	19900 MacArthur Blvd., 11th Floor		
City	Irvine	State	CA Zip 92612
Country	USA		
Telephone	(949) 223-9600	Fax	(949) 223-9610
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine and imprisonment, or both, under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this declaration is directed.			
Full name of sole or first inventor (given name, family name) Victor R. Sanchez			
Inventor's signature		Date	
Residence 14214 Edgehill Court, Fontana, CA 92337-0109		Citizenship Mexico	
Mailing Address Same As Above			
Full name of second joint inventor (given name, family name) Alberto Ceja			
Inventor's signature		Date	
Residence 9528 E. Nan Street, Pico Rivera, CA 90660		Citizenship USA	
Mailing Address Same As Above			
Full name of third joint inventor (given name, family name) Rigoberto Anguiano			
Inventor's signature		Date	
Residence 14619 California Ave., Baldwin Park, CA 91706		Citizenship Mexico	
Mailing Address Same As Above			
<input type="checkbox"/> Additional joint inventors or legal representative(s) are named on separately numbered sheets forms PTO/SB/02A or 02LR attached hereto.			

[Page 2 of 2]

EXHIBIT 5

United States Patent [19]

Sanchez et al.

[54] METHODS FOR HANDLING MASA

[75] Inventors: Victor R. Sanchez, Fontana; Alberto Ceja, Pico Rivera; Rigoberto Angulano, Baldwin Park, all of Calif.

[73] Assignee: Machine Masters, Inc., Pomona, Calif.

[21] Appl. No.: 476,198

[22] Filed: Jun. 7, 1995

Related U.S. Application Data

[62] Division of Ser. No. 192,458, Feb. 7, 1994.

[51] Int. Cl.⁶ _____ A21C 9/00

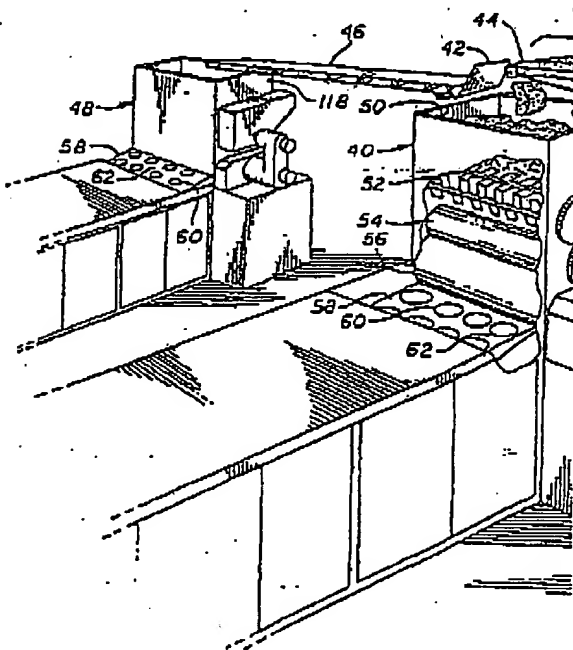
[52] U.S. Cl. _____ 426/496; 426/502; 426/503;
426/512; 426/518; 99/443 C; 99/353; 198/604;
198/607; 198/626.1; 221/84

[58] Field of Search _____ 426/391, 496,
426/502, 503, 516-518, 512, 549; 99/443 C,
352, 353; 198/604, 607, 626.1; 221/71,
74, 84

[56] References Cited

U.S. PATENT DOCUMENTS

3,693,533	9/1972	Liepa	_____	99/234
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3,869,971	3/1975	Driscoll	_____	99/353
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4,978,548	12/1990	Cope et al.	_____	426/439
4,985,269	1/1991	Irvin et al.	_____	426/560



1 of 35

THIS DRAWING IS NOT TO BE USED FOR ANY OTHER PURPOSE
 US 5,635,235 A

(11) Patent Number: 5,635,235
 (45) Date of Patent: Jun. 3, 1997

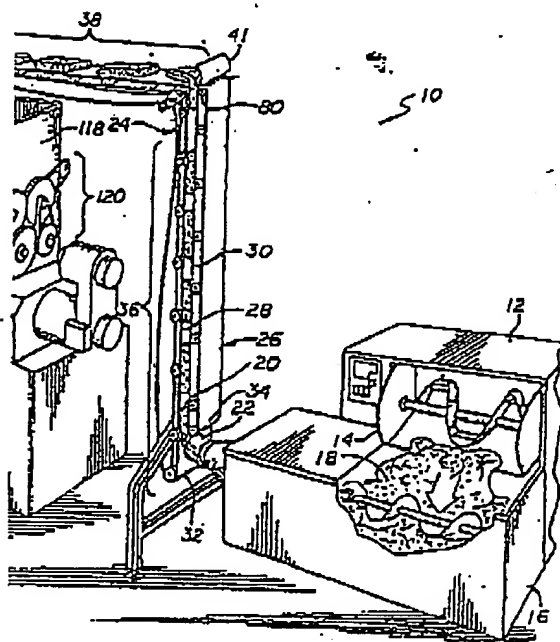
5,050,727 9/1991 Akasaka _____ 198/626.1
 5,158,792 10/1992 Mochikawa et al. _____ 426/503 X
 5,200,203 4/1993 Hayashi _____ 198/604 X
 5,272,962 12/1993 Kageyama et al. _____ 99/353

Primary Examiner—Milton Cano
 Attorney, Agent, or Firm—Keith A. Newbury, Esq.; Percy,
 Schroeder, Brueggemann & Clark

(57) ABSTRACT

Masa handling methods for the continuous processing of masa type dough in conjunction with commonly available feed processing equipment, such as a masa extruder, an oven, or cooling apparatus. One masa handling method includes a masa separator having a pair of opposed, endless belt conveyors having facing surfaces spaced apart to receive a generally continuous masa stream output from a nozzle on the masa extruder. When the masa stream moves between the conveyors, it is gripped by their facing surfaces and moved away from the nozzle, causing the masa to be separated into individual pieces, or logs. The masa handling method can also include feeding the masa to masa-hoppers fed by at least two endless belt conveyors arranged in upstream and downstream positions relative to each other. The masa is transported along the conveyors and is automatically diverted into one masa hopper by a diverter gate operated by a controller that receives a signal from a sensor sensing a masa level within an associated one of the hoppers. The hopper has one or more rotating shafts having projections to remove gas bubbles from the masa and forces it toward the sheeter rollers. A pair of primary rollers with scrapers can be provided within the hopper to roll the masa to an intermediate thickness before it passes between the sheeter rollers.

20 Claims, 4 Drawing Sheets



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METHODS FOR HANDLING MASA

This application is a division of application Ser. No. 08/192,458, filed Feb. 7, 1994.

FIELD OF THE INVENTION

The present invention relates to an apparatus and method for the commercial manufacture of food or edible material, and, more particularly, to the treatment or preparation of farinaceous dough, batter, or pastry products including sheeting, laminating, or folding.

BACKGROUND OF THE INVENTION

A tortilla is a baked grain product which originated in Mexico and is now widely consumed throughout the world. The word tortilla as used herein refers to such a baked grain product having a variety of shapes, including a circular shape, formed from a relatively flat dough. While the present invention concerns the production of tortillas, the invention also may also successfully used in the production of food products having other shapes.

As the demand for tortillas has grown, the methods and the apparatus for automatically producing tortillas in high volumes has become well known. In the conventional automated system, a dough is produced by cooking whole corn and grinding it wet or by combining instant corn masa flour with water in a commonly available mixer. This dough is generally referred to as "masa". However, the term "masa" as used herein refers to this corn dough and other doughs having similar characteristics. The masa is often fed into an extruder which compresses the masa and outputs it in the form of a generally continuous stream to a pneumatic cutter. The pneumatic cutter chops the masa into generally cylindrical pieces, generally known as "logs". The logs are usually carried on a conveyor to a masa hopper, which gravity feeds the masa to several successive pairs of generally opposed, cylindrical rollers for compression into a sheet having the thickness required for tortilla production. The final pair of opposed rollers are generally known as "sheeter" rollers because they produce a thin sheet of masa. This "sheeted" masa is then cut into the desired tortilla shape by a commonly available rotary cutter, which usually cuts circles of varying diameter. The cut masa is then baked, cooled, and packaged by commonly available commercial food processing equipment.

A portion of an automatic masa processing system is shown in the Driscoll U.S. Pat. No. 2,869,971. The masa processing system described by Driscoll has an endless belt conveyor for feeding masa to a masa hopper. The masa within the masa hopper is then gravity fed into a pair of opposed, counter-rotating primary rollers which compress the masa into a wide curtain of an intermediate thickness. The curtain then moves along a conveyor to a set of sheeter rollers for a final compression into the sheet having a thickness suitable to form the desired tortillas. The sheeted masa is then moved, via conveyor, through a rotating cutter which stamps circular shapes in the masa sheet. Although the rest of the Driscoll apparatus is designed to manufacture food chips from the cut masa, the remainder of the process of baking and cooling tortillas, which only generally concerns this invention, is well known and is schematically shown in the Cope et al. U.S. Pat. No. 4,978,548. Also by way of reference, another Mataszak et al. U.S. Pat. No. 4,640,843, describes a masa extruder and a masa hopper feeding two primary rollers and one associated sheeter roller.

The inventors of the present invention have no reason not to believe that the masa processing system previously

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described is not generally effective and safe. However, under certain conditions, there may be some drawbacks associated with masa processing systems generally designed according to the prior art. One such drawback can be the danger associated with the pneumatic cutter. The pneumatic cutter has a reciprocating blade which could injure an attending worker if that worker places his or her hands under the operating blade.

Another drawback can be associated with the conveyors intended to transport the masa logs from the pneumatic cutter to the masa hoppers. With increasing demand for tortillas, many companies now desire to operate several parallel production lines, each line having its own masa hopper and its own associated subsequent rolling, cutting, cooking, cooling, and packaging apparatus. Generally, because one masa mixer and extruder can output enough masa to adequately supply several production lines, it is desirable to have an automatic masa hopper feed system capable of maintaining an adequate supply of masa within each masa hopper. However, the conveyors designed according to the prior art simply move masa logs from the pneumatic cutter to one masa hopper. Thus, a masa handling system built according to the prior art could require several conveyors, each running independently from the pneumatic cutter to an associated masa hopper. Furthermore, human attendants could be required to monitor the level of masa in each masa hopper and guide the masa logs onto the conveyors which are running to near-empty masa hoppers. Such a system could have evident disadvantages due to the labor cost of the attendants and the awkwardness of the manual channeling of masa to each conveyor. Furthermore, if the system utilizes only one conveyor running past the masa hoppers in series, the unwanted labor expense is also necessary because human attendants could be required to maintain the masa levels by manually carrying the masa logs from the conveyor to a near-empty masa hopper.

Yet another drawback can be associated with the masa hoppers generally designed according to the prior art. Unwanted gas bubbles can become trapped in the masa and cause voids in the wide masa curtain output by the primary rollers. When this occurs, the voids persist as the masa continues through the sheeter rollers and the rotary cutter, causing imperfectly formed tortillas to be produced. To eliminate the voids, human attendants must manually compress the masa while it is in the masa hopper, resulting in undesirable increased costs.

One final drawback associated with the primary rollers designed according to the prior art can be the tendency of the masa curtain to adhere to the primary rollers after its initial compression. If the masa curtain exits from the primary rollers in a fashion whereby it is stuck to the surface of one of the rollers, the curtain can be carried around the primary roller and away from the sheeter rollers. As a result, the flow of masa to the sheeter rollers can be substantially disrupted.

It should, therefore, be appreciated that there still is a need for masa processing system that has the following features: the safe separation of the masa into individual logs; the automatic distribution of those logs to the masa hoppers requiring resupply; the automatic removal of gas bubbles from the masa within the masa hopper; and the prevention of the masa curtain from becoming stuck to the primary rollers. Accordingly, the present invention fulfills all of these needs.

SUMMARY OF THE INVENTION

The present invention provides a masa handling system that has the following features: the safe separation of the

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masa into the individual logs; the automatic distribution of those logs to the masa hoppers requiring resupply; the automatic removal of gas bubbles from the masa within the masa hoppers; and the prevention of the masa certain from becoming stuck to the primary rollers. The masa handling system of the invention is for use in conjunction with commonly available food processing equipment, such as an oven and cooling apparatus for the commercial processing of masa. By way of example, the present inventors refer to masa, but intend to include other similar doughs within the meaning of the word "masa."

Such masa processing equipment generally has a masa producing device, typically a mixer and an adjacent extruder which produces a generally continuous stream of masa to the invention. The masa is processed according to the invention and is ultimately fed into a pair of opposed, aligned, counter-rotating sheeter rollers which compress the masa into a final thickness.

More particularly, the masa handling system has a masa separator having a pair of aligned, opposed endless belt separator conveyors. The separator conveyors have their facing surfaces spaced apart and generally parallel to define a masa chamber therebetween. The masa chamber has input and output ends. The masa separator also has a nozzle connected to the masa producing device for feeding masa into the input end of the masa chamber. When the masa enters the masa chamber, it is gripped by the facing surfaces and moved therebetween. The facing surfaces of the separator conveyors move in the same direction away from the nozzle and cause the masa to be separated into masa logs.

The masa handling system includes at least two masa hoppers and at least two endless belt feed conveyors which have upper surfaces that move in the same direction. The feed conveyors are arranged in relative upstream and downstream positions relative to each other. The upstream feed conveyor extends from the output end of the masa chamber defined by the opposed, aligned separator conveyors of the masa separator, receive the masa logs. The upstream feed conveyor extends to a point generally above one of the masa hoppers. The downstream feed conveyor extends from a position spaced from the upstream conveyor to a point generally above another of the masa hoppers.

The masa handling system also has a diverter gate that is positioned between the feed conveyors. The diverter gate selectively moves between a first position and a second position. When the diverter gate is in the first position, the masa logs are guided from the upstream feed conveyor to the downstream feed conveyor. When the diverter gate is in the second position, the masa logs are guided into the masa hopper.

The masa handling system also has a sensor associated with each masa hopper for the sensing of the level of masa therein. The sensor causes a signal which changes its state when the level of masa in the associated masa hopper is below a predetermined level. A mechanism is connected to each diverter gate and is responsive to the signal from the sensor. The mechanism moves the diverter gate from the first position to the second position when the level of masa in the one masa hopper is sensed to be below the predetermined level. The mechanism returns the diverter gate to the first position when the level of masa in the one masa hopper is sensed to be above a predetermined level.

The masa hoppers are self feeding and each has an opening positioned for receiving masa from its associated feed conveyor. Each masa hopper also has a gravity feeder with side walls and a bottom wall cooperating to define a

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space for the placement of the masa to be fed to the sheeter rollers. One or more rotating shafts are mounted within the gravity feeder. Each shaft has projections which remove gas bubbles from the masa and force the masa towards the sheeter rollers. The bottom wall of the gravity feeder extends from the side walls and defines a slot which the masa passes through, towards the sheeter rollers.

The foregoing structural arrangement of the invention provides several important advantages. Chief among them is the safe separation of the generally continuous masa stream into masa logs. As discussed above, the devices designed according to the prior art incorporate a pneumatic cutter that has a blade which can injure attending workers. Accordingly, it is desirable to separate the masa stream into masa logs without the pneumatic cutter and its associated danger. The present invention avoids this problem because it does not utilize a cutter with a blade. Therefore, the present invention offers a relatively safer apparatus which can separate the masa stream into masa logs.

Another advantage associated with the invention is the automatic distribution of the masa logs to the individual masa hoppers requiring resupply. As discussed above, it is desirable to eliminate the cost of the human labor associated with maintaining the proper level of masa within each masa hopper. The automatic monitoring by the sensors and the corresponding automatic operation of the diverter gates provides for the automatic distribution of masa logs to the masa hoppers. Accordingly, the supply of masa within each masa hopper is advantageously maintained without the costs associated with human labor.

Yet another advantage with the invention is the automatic removal of gas bubbles from the masa within the masa hoppers. As discussed above, it is desirable to eliminate the human labor associated with the removal of the gas bubbles from the masa within the masa hoppers. The projections on the rotating shafts advantageously compress the masa and remove the gas bubbles without any corresponding human labor. Accordingly, the gas bubbles are advantageously removed without the costs associated with such human labor.

In one aspect of the invention, the facing surfaces of the separator conveyors are curved toward each other so that a cradle is formed for securely holding the masa between the separator conveyors. As compared to an arrangement having flat facing surfaces, the masa is less likely to move out from its position between the separator conveyors.

In another aspect of the invention, each masa hopper has a scraper for each of its primary rollers. Each scraper has a blade which is pivotally mounted and biased to longitudinally ride on the lower surface of its associated primary roller. The blade separates the masa which has adhered to the surface of the primary roller. An advantage associated with this aspect of the invention is the prevention of the masa curtain from becoming stuck to the lower surface of the primary rollers. As discussed above, it is desirable to maintain the movement of the masa curtain toward the sheeter rollers. When the masa curtain adheres to one of the primary rollers, the masa curtain may not continue toward the sheeter rollers. Accordingly, this aspect of the invention advantageously ensures that the masa curtain travels toward the sheeter rollers instead of becoming diverted by adherence to one of the primary rollers.

It will be appreciated that, while the masa handling system of the present invention is especially adapted for use with a corn based masa dough, the invention will also handle any dough that has similar properties. Accordingly, the

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invention could also be used in conjunction with any other dough which could be handled according to the masa dough handled by the present invention.

Other features and advantages of the present invention will become apparent from the following description of the preferred embodiment, taken in conjunction with the accompanying drawings, which illustrate, by way of example, the principles of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

The following drawings illustrate the preferred embodiment of the invention. In the drawings:

FIG. 1 is a perspective view of a masa handling system, partly in cut away section.

FIG. 2 is a side view showing the separator conveyors accepting masa from the nozzle.

FIG. 3 is a cross-sectional elevational view of the separator conveyors shown in FIG. 2.

FIG. 4 is a cross-sectional elevational view, partially in cut-away section, of the idler rollers shown in FIG. 3.

FIG. 5 is a side view of several feed conveyors positioned over two masa hoppers, shown in partial cut-away section.

FIG. 6 is a side view of a diverter gate shown in FIG. 5.

FIG. 6A is an end view of the diverter gate shown in FIG. 6, shown in partial cut-away section.

FIG. 7 is a side view, in partial cut-away section, of a masa hopper shown in FIG. 1.

FIG. 8 is a perspective view of the A/C motor and drive gears for the primary rollers and rotating shafts shown in FIG. 7.

FIG. 9 is a detail perspective view of the rotating shafts shown in FIG. 7.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

As shown in the exemplary drawings, the present invention is embodied in a masa handling system, generally referred to by the reference numeral 10, for use within a food processing system which produces a food product made from masa. Masa is a dough produced by cooking whole corn and grinding it wet or by combining instant corn masa hour with water in a commonly available mixer. This dough is generally referred to as "masa". However, the term "masa" as used herein refers to this corn dough and other doughs having similar characteristics.

The preferred masa handling system 10 (FIG. 1) is a part of a larger arrangement of apparatus intended for the commercial production of tortillas or other food having a masa dough as an ingredient. The general arrangement of the preferred masa handling system 10 will now be described. A commonly available commercial mixer 12 is located at the beginning of the production line. The mixer 12 has a pivoting door 14 which can rotate downward towards a masa extruder 16. The masa extruder 16 can be of any type, as long as it compresses the masa 18 and feeds a generally continuous masa stream 20 through a nozzle 22. Two vertically opposed and aligned endless belt separator conveyors 24 and 26 have moving surfaces 28 and 30 which face each other. The longitudinal ends 32 and 34 of separator conveyors 24 and 26 are mounted adjacent to the nozzle 22. One of the two separator conveyors 24 is "L" shaped and has a vertical section, or vertical portion, 36 and a horizontal section, or horizontal portion, 38 which terminates above [a] an intermediate masa hopper 40 that is in between two feed conveyors as shown in Fig 1. The vertical section 34 of the "L" shaped

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separator conveyor 24 extends longitudinally below the longitudinal end of the other separator conveyor, thereby providing a moving surface opposite from the nozzle 22. A deflector plate 41 is mounted on the end of the other separator conveyor 26. The previously discussed separator conveyors 24 and 26 move the masa 18 to the first intermediate masa hopper 40. That masa 18 hopper 40 must be supplied with masa 18 periodically.

A selectively operable diverter gate, for periodically allowing resupply of the masa hopper 40, is located [adjacent to the end 44 of] in a gap between an upstream feed conveyor (the horizontal section 38 of the "L" shaped separator conveyor 24 as shown in Fig. 1) and a downstream feed conveyor 46. The diverter gate 42 is shown in its open gap position. However, when the diverter gate 42 is [closed] in a closed gap position, its top surface 45 forms a gravity slide that feeds to a horizontal downstream feed conveyor 46, which, in turn, feeds another masa hopper which, as shown in Fig. 1, may be an end masa hopper 48. It will be understood that while two masa hoppers 40 and 48 are shown, the masa handling system 10 can be adapted for use with any number of masa hoppers. Therefore, the invention is not limited by the number of masa hoppers.

Each masa hopper 40 and 48 has a hollow inner gravity feeder portion 50 containing two counter rotating shafts 52 mounted above a pair of primary rollers 54. The primary rollers 54 are, in turn, mounted above a pair of sheeter rollers 56 and a common rotary cutter (not shown). A horizontal tortilla conveyor 58 is mounted below the rotary cutter and has tortillas 60 on its upper surface 62. The remainder of the system can include various combinations of commonly known and widely available commercial food processing apparatus (not shown), such as an oven, a cooling rack, and a packaging system.

The masa handling system 10 has a structure intended to separate masa logs 74 from a continuous stream of masa 20 (FIGS. 2, 3, and 4). The masa extruder 16 is connected to a nozzle 22. The nozzle 22 has a generally circular cross section and is angled so that its end 64

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is slightly elevated. A generally continuous masa stream 20 is shown exiting from the nozzle 22. The ends of two aligned, opposed, vertical endless belt separator conveyors 24 and 26 are spaced apart and each pass around an associated one of two drive rollers 66 adjacent to the nozzle 22. The drive rollers 66 are connected to a variable speed A/C motor 82 via a belt 70, which also passes around a tensioner wheel 72. The "L" shaped separator conveyor 24 extends longitudinally below the end of the other separator conveyor 26 and has a moving surface 28 facing the nozzle 22. The other separator conveyor 26 also has a moving surface 30. The separator conveyors 24 and 26 are spaced to hold masa pieces, or logs 74, between them. The distance separating the two separator conveyors 24 and 26 will vary with the size of the generally continuous masa stream 20 extruded from the nozzle 22. The space between the moving surfaces 28 and 30 of the separator conveyors 24 and 26 defines a masa chamber 76. The masa chamber 76 extends the vertical length of the separator conveyors 24 and 26 and has an input end 78 adjacent to the nozzle 22 and an output end 80 where the masa logs 74 are deposited onto the horizontal section 38 of the "L" shaped conveyor 24. The separate conveyors 24 and 26 must be driven in order to separate the masa logs 74 and move them away from the nozzle 22.

The variable speed A/C motor 82 is provided to drive the separator conveyors 24 and 26. The A/C motor 82 has an upper knob 84 to enable the user to adjust its speed. The required power of the motor 82 varies with the length of the separator conveyors 24 and 26 to be driven, however, an A/C motor 82 between 1/2 and 3 horsepower is generally adequate for most applications. The method by which the speed of the

motor 82 is adjusted is commonly known and can be either by a mechanical means, such as a gearbox (not shown), or an electronic means, such as by an A/C frequency inverter (not shown). While the masa 74 moves upward, the masa 74 must be prevented from falling out from between the separator conveyors 24 and 26.

The moving surfaces 28 and 30 of the separator conveyors 24 and 26 are supported by trapezoidal idler rollers 86 which keep the masa logs 74 between the separator conveyors 24 and 26. The trapezoidal idler rollers 86 cause the moving surfaces 28 and 30 of the separator conveyors 24 and 26 to curve toward each other on their edges 88. Because the edges 88 of the moving surfaces 28 and 30 are curved toward each other, a cradle 90 is formed for securely holding the masa logs 74 between the separator conveyors 24 and 26. Each idler roller 86 is fastened to the frame 92 of the conveyors 24 and 26 by well known means, such as by a threaded axle 94 and a nut 96. After the masa logs 74 have been separated from the masa stream 20, they must be guided into a masa hopper 40 which requires resupply.

The selectively operable diverter gate 42 (FIG. 5) is mounted in a gap between an upstream 98 and a downstream 100 endless belt feed conveyor and guides the masa logs 74 to the appropriate masa hopper. The feed conveyors 98 and 100 are positioned end to end thereby forming the gap between them (as shown in Fig. 5), and are vertically spaced so that the masa logs 74 can move from one feed conveyor 98 and 100 to the next, in series. The diverter [gate] gate 42 is pivotally mounted on the downstream feed conveyor 100 and, in the closed gap position, extends to the end of the upstream feed conveyor 98 thereby closing the gap by forming a gravity slide between the two feed conveyors 98 and 100. In the open gap position, the diverter gate 42 is withdrawn from the upstream feed conveyor 98. While two diverter gates 42 are shown, any number can be used, depending on the number of masa hoppers 40 desired. Generally, every masa hopper 40, except the last in the series, has an associated diverter gate 42 mounted above it. The last masa hopper 40 does not have a

diverter gate 42 because a feed conveyor 46 terminates above it. It will be understood, however, that the last masa hopper 40 could have an associated diverter gate 42 should the diversion of masa 74 from that masa hopper 40, for recycling or other purposes, be desired. The diverter gate 42 must be driven by a device in order to move between the open and closed positions.

The selectively operable diverter gate 42 (FIGS. 6 and 6A) is driven by a pneumatic cylinder 102 which is controlled by a common programmable language controller 104 (PLC). The PLC 104 is shown as separate boxes in FIG. 5 for clarity purposes. Preferably, only one PLC 104 is needed to drive multiple diverter gates 42, however, each diverter gate 42 could have its own associated PLC 104. The PLC 104 is also connected to a photo sensor 106 positioned to sense the level of masa 74 within the masa hopper 40 and provide the corresponding signal to the PLC 104. The diverter gate 42 is connected to a pneumatic cylinder 102 mounted on the downstream feed conveyor 100. The diverter gate 42 has a generally rectangular section 108 extending across the width of the feed conveyors 98 and 100 and a smaller rectangular arm 110 protruding below the rectangular section 108. The smaller rectangular arm 110 facilitates the attachment of the diverter gate 42 to the pivot point 112 and the pneumatic cylinder 102 mounted on the side of the downstream feed conveyor 100. When the pneumatic cylinder 102 withdraws the diverter gate 42 away from the upstream feed conveyor 98, the masa logs 74 drop off of the upstream feed conveyor 98, accordingly, a structure must be provided to catch the masa logs 74.

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A self feeding masa hopper 40 (FIG. 7, 8, and 9) is located beneath the end of the upstream feed conveyor 98 and catches the masa logs 74 after they have been diverted. The self feeding masa hopper 40 has a gravity feeder including side walls 113 and a curving bottom wall 114 which defines a slot 116. A pair of horizontal counter-rotating shafts 52 are mounted within the gravity feeder 50. The shafts 52 are generally parallel to each other and longitudinally straddle the slot 116, which is below the shafts 52 in the bottom wall of the gravity feeder 50. One end of each of the shafts 52 extends through the wall 118 of the masa hopper 40 to interface with drive gears 120 to be described later. The shafts 52 have rectangular projections 122 which are positioned in an alternating fashion so as to enable the projections 122 to intermesh and pass through the same space above the slot 116 as they are rotated. When the projections 122 pass above the slot 116, they drive the masa 74 through the slot 116 so it can be rolled. Accordingly, a structure must be provided to roll the masa 74.

The self feeding masa hopper 40 has a pair of horizontal primary rollers 54 to accept the masa 74 which passes through the slot 116. The primary rollers 54 have a cylindrical surface 124 and are mounted in a generally parallel, horizontally aligned relationship between two endcaps 126. The endcaps 126 prevent the masa 74 from moving horizontally, along the surface 124 of the primary rollers 54, past the ends of the primary rollers 54. The primary rollers 54 are positioned so that a gap 128 is defined between their converging surfaces 124. The gap 128 is below and aligns with the slot 116 to facilitate the travel of the masa 74 from the slot 116 through the primary rollers 54. The width of the gap 128 varies according to the food product to be produced, but is generally 1/4 inch for typical tortilla production. It is to be understood that the width of the gap 128 between the primary rollers 54 of the masa hopper 40 can be varied according to the food product. Accordingly, the invention is not to be limited by the gap 128 between the primary rollers 54 of the masa hopper 40. After the masa 74 has passed through the gap 128, the masa 74 often adheres to the surfaces 124 of the primary rollers 54.

Two scrapers 130 are provided to prevent the masa 74 from adhering to the primary rollers 54. Each scraper 130 has a generally rectangular blade 132 which has a sharp point 134 that rides along the lower surface 136 of a primary roller 54 and separates any adhering masa 74. The blade 132 is made from ultra high molecular weight (UHM) copolymer plastic or any common equivalent, such as polytetrafluoroethylene. A stainless steel pivoting beam 138 is attached along the base of the blade 132 by screws (not shown) countersunk into the blade 132 material. The pivoting beam 138 has a generally square cross section, but has cylindrical ends 140. A threaded, centered hole 142 is provided on each end of the beam 138 for attachment to the masa hopper 40. Two arms 143 are perpendicularly attached to each beam 138 and extend behind the blade 132. The arms 143 are joined to the beam 138 by welding or any other common joining process. A spring 144 is connected between the end of each arm 143 and the wall 118 of the masa hopper 40, thereby providing a biasing force to keep the blade 132 riding on the lower surface 136 of the primary roller 54. Once the masa 74 has passed by the scrapers 130, it has a thickness to great for forming tortillas 60. Accordingly, the masa 74 must be compressed yet again.

Two sheeter rollers 56 are provided for compressing the masa 74 to the final thickness which is suitable for the final cutting of the tortillas 60. The sheeter rollers 56 are generally cylindrical and are mounted in a generally parallel, horizontally

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